

COMPUTER SCIENCE (PH.D.)

Requirements

Course	Title	Credits
Research Courses		
CISC 7070	Research Methods	3
CISC 7075	Research Project ¹	3
CISC 7076	Research Paper ¹	0
Breadth Requirements		
One qualifying course from each of Groups I, II, and III		9
Two qualifying or non-qualifying courses drawn from Groups I-III ²		6
Depth Requirements		
Two electives from Group IV		6
Pedagogy Requirement		
CISC 7090	Doctoral Pedagogy Seminar	3
CISC 7580	Computer Science Teaching Experience (taken four times, for two credits)	8
Qualifying Exams		0
Students must complete three qualifying exams (see details below).		
CISC 0931	Ph.D. Qualifying Exam: Computer Science	0
Dissertation		
CISC 0950	Dissertation Proposal Preparation (taken at least two times, for four credits)	8
CISC 0960	Proposal Defense Computer Science	0
CISC 7999	Dissertation Research in Computer Science	24
Total Credits		70

¹ The final report for the research project in a seminar setting (CISC 7076 Research Paper) must be completed within 24 months of matriculation in the program. The report must detail research of publishable quality, as demonstrated, for example, by having the paper be accepted by a selective conference. The student must also complete a presentation on the project, which should include a thorough review of the literature in the area.

² Any course with the attribute CSFT (Group I), CSSS (Group II), or CSID (Group III) may fulfill this requirement.

Dissertation Progress Policies

A student may be placed on academic probation if they do not have an accepted dissertation proposal in at most 5 semesters after passing their qualifying exams, or if they have not completed their dissertation in at least 5 semesters after proposal approval.

Qualifying Exam Requirement

Each student must complete a qualifying exam before they are permitted to proceed to develop a dissertation proposal. The exam is satisfied by the student obtaining a grade of A or A- in at least one course from specific courses drawn from each of the three groups (I-III), noted below. These courses each include some coursework which focuses on

ethically-informed computer science training in the subject area of the course.

Group I: Foundations & Theory

Courses in this group have the CSFT attribute.

Course	Title	Credits
CISC 5200	Computer Language Theory	3
CISC 5825	Computer Algorithms	3
CISC 6150	Programming Languages	3
CISC 6660	Applied Cryptography	3
CISC 6890	Advanced Computer Algorithms	3
CISC 7010	Formal Methods	3

Qualifying Courses

The following courses in this list are qualifying exam courses and, additionally, have the CSFQ attribute:

Course	Title	Credits
CISC 5200	Computer Language Theory	3
CISC 6890	Advanced Computer Algorithms	3
CISC 7010	Formal Methods	3

Group II: Systems & Software

Courses in this group have the CSSS attribute.

Course	Title	Credits
CISC 5550	Cloud Computing	3
CISC 5640	Nosql Database Systems	3
CISC 6100	Software Engineering	3
CISC 6110	Computer Networks: Architecture, Design, and Modeling	3
CISC 6345	Advanced Database Systems	3
CISC 6630	Wireless Security	3
CISC 6750	IOT Forensics and Security	3
CISC 6935	Advanced Distributed Systems	3
CISC 7110	Advanced Computer Networks	3

Qualifying Courses

The following courses in this list are qualifying exam courses and, additionally, have the CSSQ attribute:

Course	Title	Credits
CISC 6110	Computer Networks: Architecture, Design, and Modeling	3
CISC 6345	Advanced Database Systems	3
CISC 6935	Advanced Distributed Systems	3
CISC 7110	Advanced Computer Networks	3

Group III: Informatics & Data Analysis

Courses in this group have the CSID attribute.

Course	Title	Credits
CISC 5352	Machine Learning in Finance	3
CISC 5700	Cognitive Computing	3
CISC 5790	Data Mining	3
CISC 5800	Machine Learning	3
CISC 5950	Big Data Computing	3
CISC 6000	Deep Learning	3
CISC 6525	Artificial Intelligence	3
CISC 6910	Data and Information Fusion	3

Qualifying Courses

The following courses in this list are qualifying exam courses and, additionally, have the CSIQ attribute:

Course	Title	Credits
CISC 5800	Machine Learning	3
CISC 6525	Artificial Intelligence	3
CISC 6910	Data and Information Fusion	3

Group IV: Advanced Topics

Courses in this group have the CSAT attribute.

Course	Title	Credits
CISC 6210	Natural Language Processing	3
CISC 6352	Advanced Computational Finance	3
CISC 6376	Software Design Patterns	3
CISC 6500	Bioinformatics	3
CISC 6550	Systems Neuroscience	3
CISC 6625	Educational Data Mining and Learning Analytics	3
CISC 6640	Privacy and Security in Big Data	3
CISC 6700	Medical Informatics	3
CISC 6880	Blockchain Technology	3
CISC 7120	Robotics	3
CISC 7510	Computer Vision/Image Recognition	3
CISC 7650	Cybersecurity Operations	3